Creality CR10 STANDALONE MOD

Version 0.1

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Thingiverse	https://www.thingiverse.com/thing:5224673
Github	https://github.com/d1rty-pixel/CR10-Standalone-Mod

Document History

Version	Date	Author	Remarks
0.1	2022-01-30	Tristan Cebulla	Initial version (unstable)

About this modification

This mod:

- adds a Voron-styled electronics compartment underneath the printer to replace the factory control box. It will also add stability and rigidity and weight to the frame. It also improves cooling and provides better maintenance access to your electronics.

- will require you to disassemble your printer, do some re-wiring and fiddle with mains power.

- is considered work-in-progress as many parts are not final and are subject to change.

Although this mod should work on any CR10, it only has been tested on the CR10 V2. Please check dimensions and for colliding parts.

A word of caution

You are about to disassemble your printer. Do not continue unless you know what you are doing. These instructions do not replace fundamental knowledge of how a 3D printer works.

You will need to rewire the electronics of your printer. Your printer runs on 110/220 volts. It is important to understand what you are doing to avoid injury and death. Mains power can kill, and it will hurt the entire time you're dying from it. This is not something you want to guess your way through.

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Bill of Material (BOM)

Frame

The CR10 3D printer is assembled of aluminium extrusion profiles that come pre-drilled for easy and convenient assembly. Since this requires precise drilling, this mod uses slot 6 L shape inner connectors to connect the extrusion profiles to each other.

Component	Standard	Qty	Dimensions / Length
Aluminium Extrusion 2020	Type B Slot 6	3	410 mm
Aluminium Extrusion 2020	Type B Slot 6	1	400 mm
Aluminium Extrusion 2020	Type B Slot 6	2	390 mm
Aluminium Extrusion 2020	Type B Slot 6	1	360 mm
Aluminium Extrusion 2020	Type B Slot 6	1	320 mm
Aluminium Extrusion 2020	Type B Slot 6	1	100 mm
Aluminium Extrusion 2020	Type B Slot 6	4	60 mm
Aluminium Extrusion 2020	Type B Slot 6	2	40 mm
Aluminium Extrusion 2040	Type B Slot 6	4	60 mm
L Shape Inner Connectors with screws	Slot 6	40	
Hammer nut	Slot 6	32	M3
Acrylic plate	Temperature resistance 70° C	1	390 mm x 320 mm

Electronic Parts

The electronics compartment will contain your mainboard and a power supply unit (PSU). In addition, you are also able to fit in a secondary PSU, a Raspberry PI, a Solid State Relay and other parts you may need or want to equip your printer with.

Please note that the DIN rails are mounted in non-standard way. According to safety regulations you are not allowed to mount DIN railing hardware onto the rail when used in this orientation. Use a connector clip from the Voron team instead!

Component	Standard	Qty	Dimensions / Length
DIN railing	EN 50022	2	350 mm
DELTA AFB0624EH	60mm, 24V	2	max. thickness 25mm
IEC-GS-1-100		1	

Sourcing Guide

You are not bound to use these exact parts. However, they will make your life easier, because someone else already made thoughts on that.

Mains power connector

The mains power connector plate is especially designed for the IEC-GS-1-100 connector. You can use another connector, but you will need to modify the plate.
https://www.digikey.de/en/products/detail/adam-tech/IEC-GS-1-100/9831135

RJ-45 network connector

USB connector

SD connector

Cooling fans

The fans that provide cooling are quality parts from DELTA. They run on 24V and can be connected to your PSU or your mainboard, if this provides a 2 pin header.
https://de.aliexpress.com/item/1653518171.html

Of course you also can use 12V fans, but you would need a voltage converter module that requires additional space and mounting.

The fan must not be thicker than 25 mm.

Additional, alternate and upgraded quality parts

It is always a good idea to invest in quality parts when doing this kind of upgrade.

- Mean Well PSU for printer / Raspberry Pi (5,1 V)
- Raspberry Pi 4 4GB
- BL Touch / Inductive Probe
- Solid State Relay
- 220V heatbed

Print parts

All parts can be printed from PLA, however ABS is recommended.
To match the theme of this mod you are encouraged to use a filament similar to the "Creality blue". A suitable HEX color code might be `#18ADE8`.

Print settings:
- 5 wall lines
- 30% infill
- No support needed

STL files overview

A STL file may contain suffixes like `_x[number]`. They indicate to print this part times the number behind the x.

`plate_normal_x4.stl`	Cover plate (4x)
`plate_fan_x2.stl`	Cover plate with fan mount (2x)
`plate_mains_connector.stl`	Cover plate to mount all connectors on
`plate_passthrough.stl`	Passthrough hole for all cables if you do not want to add separate connectors

Vendor print parts

DIN rail clips and part brackets from the Voron team can be found here:
https://github.com/VoronDesign/Voron-2/tree/Voron2.4/STLs/VORON2.4/Electronics_Compartment/DIN_Brackets

Please check the Voron documentation for print settings on their parts. Normally they recommend to print in ABS.

LCD / Display Panel

Please find an appropriate model for your display type. It can be mounted onto the frame in any location. Please check cable lengths for the display connector. Depending on the mount location of your LCD display, you probably do not need the associated extrusion profiles (2x 40 mm, 1x 100 mm).

Assembly instructions

You are about to disassemble your printer. Make sure you do not need to print parts anymore.

Disconnect the printer from mains power!

You need to remove all electrical connections from all stepper motors, the hot end, thermistors, the bed etc. Then completely disassemble the original control box.

Remove the shock absorbers from the original frame

Assemble the frame as shown and mount the shock absorbers again

Mount the DIN rails, the cover plate and all printed parts as shown. Pease note that the DIN rails were not meant for this type of montage, so you cannot install DIN railing-comlpatible electrical parts like power supplies directly to the rail. Use a connector clip instead!

Assemble the connector plate

Make electrical connections as per your hardware requirements

Connect bed, hotend and other components to the connector plate